

First report on five species of genus *Onthophagus* Latreille, 1802 (Coleoptera, Scarabaeidae) from Madhya Pradesh, India, and their description of external male genitalia

Kailash Chandra¹ & Devanshu Gupta^{2*}

¹ Zoological Survey of India, New Alipore, Kolkata - 700053, West Bengal, India; e-mail: kailash611@rediffmail.com

²Zoological Survey of India, Central Zone Regional Centre, Jabalpur - 482002, Madhya Pradesh, India

*Corresponding author, e-mail: devanshuguptagb4102@gmail.com

ABSTRACT

Onthophagus (*Onthophagus*) *duporti* Boucomont, 1914, *O.* (*O.*) *mopsus* (Fabricius, 1792), *O.* (*O.*) *orissanus* Arrow, 1931, *O.* (*O.*) *truncaticornis* (Schaller, 1783) and *O.* (*Colobonthophagus*) *paliceps* Arrow, 1931 are recorded for the first time from Madhya Pradesh (India) with their external male genitalia diagnosed for the first time. A checklist pertaining to Madhya Pradesh including 34 species of *Onthophagus* distributed in six subgenera is also provided.

KEY WORDS

Coleoptera; India; Madhya Pradesh; *Onthophagus*; Scarabaeidae.

Received 24.11.2011; accepted 10.12.2011; printed 30.06.2012

INTRODUCTION

The Subfamily Scarabaeinae currently includes around 5700 valid species united in 227 genera and 12 tribes. Of these, the tribe Onthophagini is the most diverse and includes 2500 species, slightly under half of the described species in the entire Scarabaeinae (Davis et al., 2008). Onthophagini have a worldwide distribution and include about 30 genera, of which the sub-cosmopolitan and mega-diverse genus *Onthophagus* Latreille, 1802 comprises 2300 described species (Schoolmeesters et al., 2008).

The majority of species of the genus are dung feeders but few are also carrion feeder. The Fauna of British India, including Ceylon and Burma volume III devoted to Coprinae (=Scarabaeinae) included 17 species of *Onthophagus* from Madhya Pradesh (Arrow, 1931). Balthasar (1963) listed 551 species of the genus belonging to 16 subgenera from Oriental and Palaearctic region but did not provide much information on the distribution of *Onthophagus* in Madhya Pradesh. Subsequently, Chandra & Ahirwar (2007) reported 23 species of

Onthophagus from Madhya Pradesh and Chhattisgarh. Recently, Chandra & Gupta (2011a, 2011b, 2012) added seven species of the genus from Madhya Pradesh.

While further working on unidentified material from Madhya Pradesh, five species of genus *Onthophagus*, new for Madhya Pradesh i.e. *Onthophagus* (*Onthophagus*) *duporti* Boucomont, 1914, *O.* (*O.*) *mopsus* (Fabricius, 1792), *O.* (*O.*) *orissanus* Arrow, 1931, *O.* (*O.*) *truncaticornis* (Schaller, 1783) and *O.* (*Colobonthophagus*) *paliceps* Arrow, 1931 were identified and their external male genitalia studied. Compiling all the published information and current report regarding diversity and distribution of *Onthophagus* in Madhya Pradesh, a checklist constituting 34 species under six subgenera is also prepared (Table 1).

MATERIALS AND METHODS

Specimens studied belong to the unidentified collections of dung beetles present in Central Zone Regional Station, in the Zoological Survey of India

collection (ZSI), Jabalpur, from Singhori Wildlife Sanctuary (Raisen), Morena, Pench Tiger Reserve (Seoni) and Kanha National Park (Mandla) of Madhya Pradesh (India).

Specimens were cleaned and softened in a dish of hot water, the abdomen was separated from the body, and the aedeagus was extracted from the abdomen. The abdomen was then glued to the body to keep the specimens intact.

The aedeagus was cleaned in a hot water solution of 10% KOH and washed in 95% ethanol and after examination stored in a glass vial containing 70% alcohol. Genitalia and whole insects were studied and photographed using Leica M 205 A Binocular Microscope. The specimens were identified with the help of available literature (Arrow, 1931) and compared with reference collection present in ZSI, Jabalpur. Classification adopted in the paper is after Smith (2006).

RESULTS

Altogether five species of genus *Onthophagus* viz. *Onthophagus (Onthophagus) duporti* Boucomont, 1914, *O. (O.) mopsus* (Fabricius, 1792), *O. (O.) orissanus* Arrow, 1931, *O. (O.) truncaticornis* (Schaller, 1783) and *O. (Colobonthophagus) palliceps* Arrow, 1931 were studied and reported for the first time from Madhya Pradesh.

The species were distributed in two subgenera viz. *Onthophagus* and *Colobonthophagus*. Thirty four species of *Onthophagus* under 6 subgenera are so far recorded from Madhya Pradesh (Table 1).

SYSTEMATICS

Order Coleoptera Linnaeus, 1758
 Suborder Polyphaga Emery, 1886
 Family Scarabaeidae Latreille, 1802
 Subfamily Scarabaeinae Latreille, 1802
 Tribe Onthophagini Burmeister, 1846
 Genus *Onthophagus* Latreille, 1802
 Type species: *Scarabaeus taurus* Schreber, 1759

Onthophagus (Onthophagus) duporti Boucomont, 1914

Onthophagus duporti - Boucomont, 1914: 228.
Onthophagus duporti - Arrow, 1931: 353.

Onthophagus (Onthophagus) duporti (Balthasar, 1963: 337).

EXAMINED MATERIAL. Madhya Pradesh, Raisen, Singhori Wildlife Sanctuary, Barna Dam, 04.IV.2011 (1 male, 1 female), leg. S. Sambath and the partners (Reg. no. ZSI/CZRC/A-16272).

DESCRIPTION (Fig. 1). Length 7.0 mm, maximum width 4.5 mm. Chestnut brown, oval and convex. Elytra black with some yellow strips. Head with its sides rounded and clypeus feebly produced and truncate. A short, blunt and conical horn present at the inner margin of each eye near frons. Pronotum bearing a small tubercle just behind front margin in middle and a pair of tubercles present a short distance apart midway between front and hind margins. Male genitalia (Fig. 6). Phallobase almost double in length as parameres. Parameres broad at base, sharply and regularly tapered distally and curved ventrally, tips pointed and with a broad rounded membrane.

DISTRIBUTION. India: Madhya Pradesh, Bihar and South India (Arrow, 1931). Elsewhere: Myanmar (Arrow, 1931), Thailand, Vietnam and Laos (Balthasar, 1963).

Onthophagus (Onthophagus) mopsus (Fabricius, 1792)

Scarabaeus mopsus - Fabricius, 1792: 58.
Onthophagus mopsus - Arrow, 1931: 328-329.
Onthophagus (Onthophagus) mopsus - Balthasar, 1963: 441.

EXAMINED MATERIAL. Madhya Pradesh, Morena, Kheda, 27.IV.2011 (1 male), Sandeep and Devanshu (Reg. no. ZSI/CZRC/A-16271).

DESCRIPTION (Fig. 2). Length 7.5 mm, maximum width 5.4 mm. Oval, not very convex, blackish brown with a slight metallic lustre but not very shining. Dorsally, clothed with fairly closely and very minute greyish setae. Head bears an extremely long and slender horn, arising in front of eyes and curving backward beyond hind margin of pronotum. In middle, pronotum is smooth and unpunctured and a little flattened, with a strong tubercle on each side. Male genitalia (Fig. 7): phallobase a little longer than parameres. Parameres broad at base, slightly tapered distally with apical part obliquely placed ventrally, with tips pointed and a membranous plate on dorsal side.

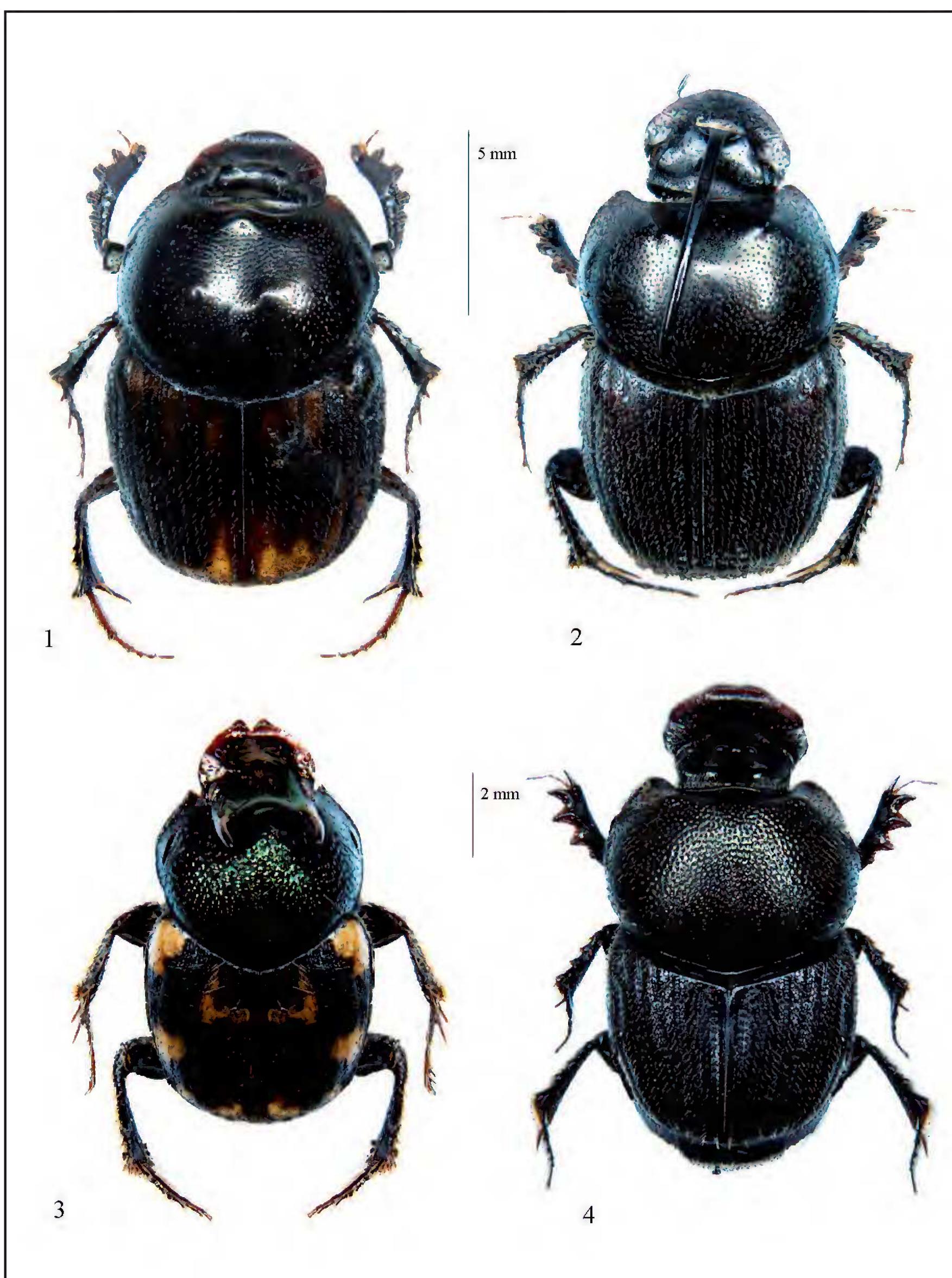


Figure 1. *Onthophagus (Onthophagus) duporti*, male. Figure 2. *Onthophagus (O.) mopsus*, male. Figure 3. *Onthophagus (O.) orissanus*, male. Figure 4. *Onthophagus (O.) truncaticornis*, male.

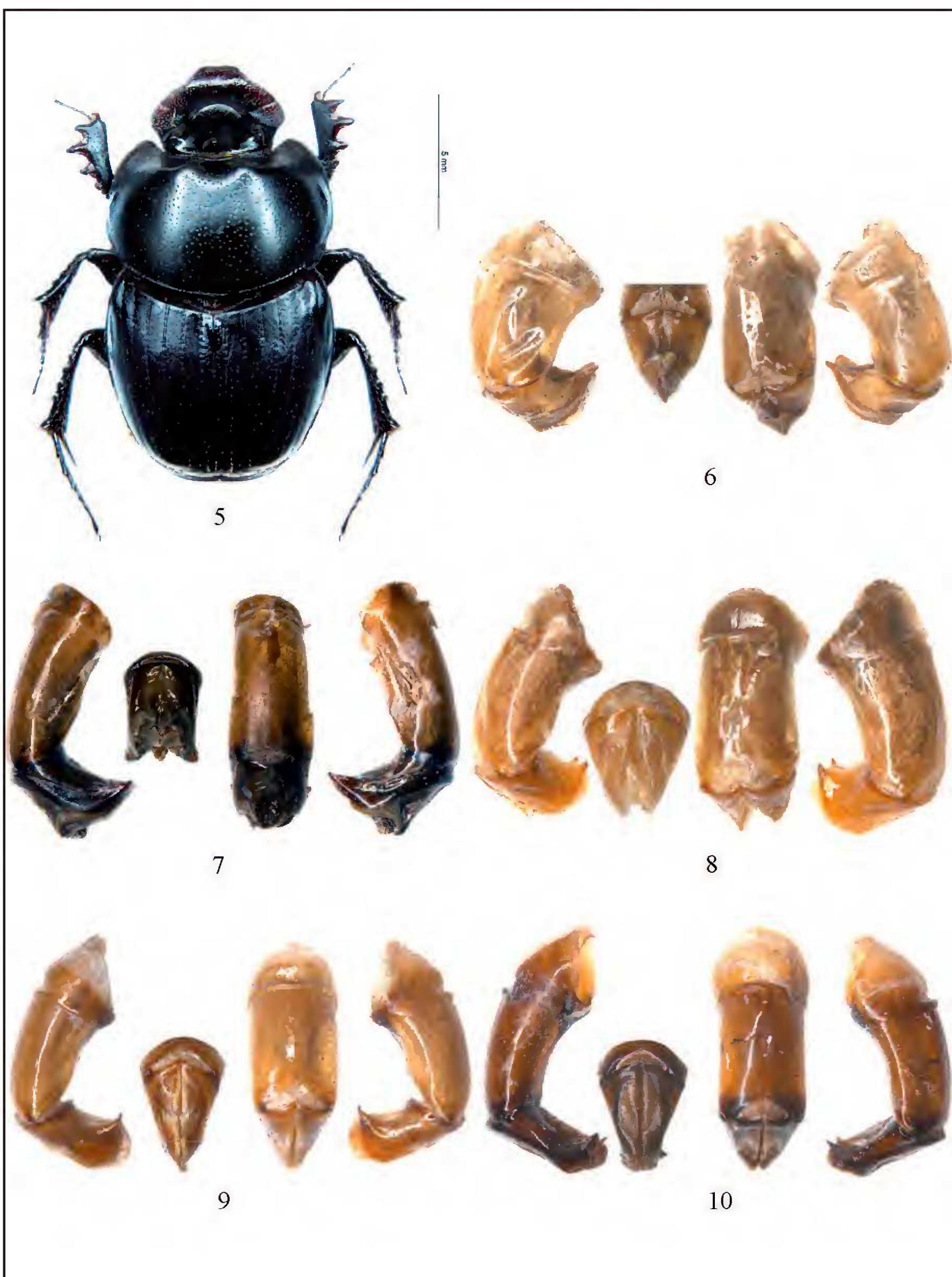


Figure 5. *Onthophagus (Colobonthophagus) paliceps*, male. Figures 6-10. External male genitalia of *Onthophagus (Onthophagus) duporti* (Fig. 6), *Onthophagus (O.) mopsus* (Fig. 7), *Onthophagus (O.) orissanus* (Fig. 8), *Onthophagus (O.) truncaticornis* (Fig. 9), *O. (C.) paliceps* (Fig. 10).

DISTRIBUTION. India: Bihar, Jammu & Kashmir, Madhya Pradesh, Uttar Pradesh, Uttarakhand and West Bengal. Elsewhere: Pakistan (Arrow, 1931).

***Onthophagus (Onthophagus) orissanus* Arrow, 1931**

Onthophagus orissanus - Arrow, 1931: 257.

Onthophagus (Onthophagus) orissanus - Balthasar, 1963: 464.

EXAMINED MATERIAL. Madhya Pradesh, Pench Tiger Reserve, Seoni, Baghdes Bar., 27.VII.2001 (1 male), M.L. Koshta (Reg. no. ZSI/CZRC/A-16270).

DESCRIPTION (Fig. 3). Length 6.50 mm, width 3.0 mm. Oval and moderately convex. Head, pronotum, pygidium and lower surface dark metallic green. Each elytra decorated with a yellow spot upon shoulder, one spot divided into two near suture at base, one near middle of outer margin, and two near posterior margin. Dorsal portion and pygidium closely clothed with long, erect and yellow hairs. Clypeus produced, deeply notched and sharply bilobed in front. Head bears a pair of backwardly directed horns which are moderately broad at base slender at the end and united by a curved carina enclosing a half-circle at its posterior margin. Male genitalia (Fig. 8): phallobase twice as long as parameres. Parameres a little curved broad at base and pointed apically at ventral portion.

DISTRIBUTION. India: Madhya Pradesh, Bihar (Balthasar, 1963), and Orissa (Arrow, 1931).

REMARKS. The species can be differentiated from *O. kchatriya* Boucomont, 1914 by the presence of following two characters; front angles of pronotum pointed and deeply notched and sharply bilobed clypeus in front.

***Onthophagus (Onthophagus) truncaticornis* (Schaller, 1783)**

Scarabaeus truncaticornis - Schaller, 1783: 238.

Onthophagus truncaticornis - Arrow, 1931: 322-323.

Onthophagus (Onthophagus) truncaticornis - Balthasar, 1963: 568.

EXAMINED MATERIAL. Madhya Pradesh, Mandla, Keolari, 13.VII.2008 (8 males, 5 females), coll. Akhilesh (Reg. no. ZSI/CZRC/A-16279).

DESCRIPTION (Fig. 4). Length 8.0 mm, maximum width 2.85 mm. Broadly oval and very convex. Dark

greenish-black, not very shining except upon head, front part of pronotum and lower surface. Dorsally, closely clothed with short reddish setae. Head with clypeal margin strongly reflexed and separated from smooth forehead by a feeble rounded carina. Vertex produced backward as a nearly semicircular plate, which curves upward and rises to a short erect horn which bifurcates at the tip.

Male genitalia (Fig. 9): phallobase twice as long as parameres. Parameres curved and strongly pointed apically the distal end and with a broad plate.

DISTRIBUTION. India: Madhya Pradesh, Kerala (Balthasar, 1963), Karnataka, Maharashtra, and Tamil Nadu (Arrow, 1931).

***Onthophagus (Colobonthophagus) paliceps* Arrow, 1931**

Onthophagus paliceps - Arrow, 1931: 287.

Onthophagus (Colobonthophagus) paliceps - Balthasar, 1963: 467.

EXAMINED MATERIAL. Madhya Pradesh, Mandla, Keolari, 13.VII.2008 (1 male, 1 female), coll. Akhilesh (Reg. no. ZSI/CZRC/A-16273).

DESCRIPTION (Fig. 5). Length 10.5 mm, maximum width 6.0 mm. Oval, moderately convex and black. Clypeus truncate, a little produced and feebly notched at front margin and separated by a semicircular carina from lightly punctured forehead. Head bears a short, slender and upwardly-curved horn at posterior margin. On each side at inner margin of eye, there is a shorter, transversely placed and rectangular erect process. Pronotum minutely and sparsely punctured, little hollowed transversely in front and bears, two blunt angulations placed rather far apart at upper margin of declivity.

Male genitalia (Fig. 10): phallobase almost twice as long as parameres. Parameres a little flattened and not broad with its pointed and curving ventral portion.

DISTRIBUTION. India: Madhya Pradesh and Uttarakhand (Arrow, 1931; Balthasar, 1963).

ACKNOWLEDGMENTS

The authors are thankful to Dr. K. Venkataraman, Director, Zoological Survey of India, Kolkata for providing necessary facilities and encouragement.

S. No.	Species name	District wise distribution in Madhya Pradesh	References
1	<i>Onthophagus (C.) bengalensis</i> Harold, 1886	Damoh	Chandra & Gupta, 2011a
2	<i>Onthophagus (C.) hindu</i> Arrow, 1931	Damoh, Hoshangabad, Jabalpur	Chandra & Gupta, 2011b; Chandra et al., 2011, 2012
3	<i>Onthophagus (C.) paliceps</i> Arrow, 1931	Mandla	new record from Madhya Pradesh
4	<i>Onthophagus (C.) tragus</i> (Fabricius, 1792)	Mandla	Chandra & Ahirwar, 2005b
5	<i>Onthophagus (D.) bonasus</i> (Fabricius, 1775)	Betul, Balaghat, Hoshangabad, Umaria, Mandla	Arrow, 1931; Chandra & Ahirwar, 2005a, 2005b, 2007; Chandra et al., 2011
6	<i>Onthophagus (D.) gazella</i> (Fabricius, 1787)	Indore, Betul, Balaghat, Damoh, Seoni, Hoshangabad, Jabalpur, Umaria, Mandla	Arrow, 1931; Chandra, 2002; Chandra & Ahirwar, 2005a, 2005b, 2007; Chandra & Gupta, 2011a; Chandra et al., 2011, 2012
7	<i>Onthophagus (M.) hystrix</i> Boucomont, 1914	Mandla, Balaghat	Arrow, 1931; Chandra & Ahirwar, 2007
8	<i>Onthophagus (O.) agnus</i> Gillet, 1925	Indore, Seoni	Arrow, 1931; Chandra, 2002; Chandra & Ahirwar, 2007
9	<i>Onthophagus (O.) abacus</i> Boucomont, 1921	Seoni	Chandra & Gupta, 2012
10	<i>Onthophagus (O.) abreui</i> Arrow, 1931	Betul, Seoni	Arrow, 1931; Chandra & Ahirwar, 2007
11	<i>Onthophagus (O.) brevicollis</i> Arrow, 1931	Balaghat, Raigarh	Arrow, 1931; Chandra & Ahirwar, 2007
12	<i>Onthophagus (O.) centricornis</i> (Fabricius, 1798)	Balaghat, Raigarh	Arrow, 1931; Chandra & Ahirwar, 2007
13	<i>Onthophagus (O.) cervus</i> (Fabricius, 1798)	Balaghat, Riwa, Umaria, Jabalpur, Mandla	Arrow, 1931; Chandra & Ahirwar, 2005a & b, 2007; Chandra et al., 2012
14	<i>Onthophagus (O.) dama</i> (Fabricius, 1798)	Balaghat, Hoshangabad, Jabalpur, Umaria, Mandla	Arrow, 1931; Chandra & Ahirwar, 2005a, 2005b, 2007; Chandra et al., 2011, 2012
15	<i>Onthophagus (O.) duporti</i> Boucomont, 1914	Raisen	new record from Madhya Pradesh
16	<i>Onthophagus (O.) fasciatus</i> Boucomont, 1914	Riwa, Shahdol, Umaria	Arrow, 1931; Chandra & Ahirwar, 2005a; Chandra & Ahirwar, 2007
17	<i>Onthophagus (O.) gratus</i> Arrow, 1931	Mandla	Chandra & Gupta, 2012
18	<i>Onthophagus (O.) griseostosus</i> Arrow, 1931	Mandla, Balaghat, Raigarh, Hoshangabad, Jabalpur	Arrow, 1931; Newton & Malcolm, 1985; Chandra & Ahirwar, 2005b, 2007; Chandra et al., 2011, 2012
19	<i>Onthophagus (O.) laborans</i> Arrow, 1931	M. P.	Arrow, 1931; Chandra & Ahirwar, 2007
20	<i>Onthophagus (O.) mopsus</i> (Fabricius, 1792)	Morena	new record from Madhya Pradesh
21	<i>Onthophagus (O.) orientalis</i> Harold, 1868	Balaghat, Raigarh	Arrow, 1931; Chandra & Ahirwar, 2007
22	<i>Onthophagus (O.) orissanus</i> Arrow, 1931	Seoni	new record from Madhya Pradesh
23	<i>Onthophagus (O.) ramosus</i> (Wiedmann, 1823)	Indore, Jabalpur, Sidhi, Damoh, Mandla, Bhopal, Umaria, Hoshangabad	Arrow, 1931; Chandra & Ahirwar, 2005a, 2005b, 2007; Chandra & Gupta, 2011a; Chandra et al., 2011, 2012
24	<i>Onthophagus (O.) ramosellus</i> Bates, 1891	Betul, Hoshangabad,	Arrow, 1931; Chandra & Ahirwar, 2007; Chandra et al., 2011

S. No.	Species name	District wise distribution in Madhya Pradesh	References
25	<i>Onthophagus (O.) rufus</i> Sharp, 1875	Jabalpur	Chandra & Gupta, 2012; Chandra et al., 2012
26	<i>Onthophagus (O.) quadridentatus</i> (Fabricius, 1798)	Damoh, Riwa, Umaria, Hoshangabad, Jabalpur	Arrow, 1931; Chandra & Ahirwar, 2005a, 2007; Chandra & Gupta, 2011a; Chandra et al., 2011, 2012
27	<i>Onthophagus (O.) spinifex</i> (Fabricius, 1781)	Mandla, Seoni	Chandra & Gupta, 2011b
28	<i>Onthophagus (O.) tarandus</i> (Fabricius, 1792)	Umaria, Seoni, Sidhi, Hoshangabad, Balaghat, Riwa, Mandla	Arrow, 1931; Chandra & Ahirwar, 2005a, 2005b, 2007
29	<i>Onthophagus (O.) truncatocornis</i> (Schaller, 1783)	Mandla	new record from Madhya Pradesh
30	<i>Onthophagus (O.) unifasciatus</i> (Schall., 1783)	Jabalpur	Chandra et al., 2012
31	<i>Onthophagus (O.) zebra</i> Arrow, 1931	Indore	Arrow, 1931; Chandra & Ahirwar, 2007
32	<i>Onthophagus (P.) amplexus</i> Sharp, 1875	Jabalpur	Chandra & Gupta, 2012; Chandra et al., 2012
33	<i>Onthophagus (P.) pactolus</i> (Fabricius, 1787)	Damoh, Hoshangabad, Umaria, Indore, Mandla, Seoni	Arrow, 1931; Newton & Malcolm, 1985; Chandra, 2002; Chandra & Ahirwar, 2005a, 2005b, 2007; Chandra & Singh, 2004; Chandra & Gupta, 2011a; Chandra et al., 2011.
34	<i>Onthophagus (S.) sagittarius</i> (Fabricius, 1775)	Riwa, Umaria, Hoshangabad, Mandla	Arrow, 1931; Chandra & Ahirwar, 2005a, 2005b, 2007; Chandra et al., 2011;

Table 1. Checklist of *Onthophagus* from Madhya Pradesh.

REFERENCES

Arrow G. J., 1931. The Fauna of British India including Ceylon and Burma. Col. Lamell. III, (Coprinae). Taylor & Francis, London, 428 pp.

Balthasar V., 1963. Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region, Coleoptera: Lamellicornia, Verlag der Tschechoslowakischen Akademie der Wissenschaften Prag, Vol. 2, 627 pp.

Boucomont, A. 1914. *Onthophagus* asiatiques nouveaux ou peu connus. Annali del Museo Civico di Storia Naturale di Genova, 46: 210-243.

Chandra K., 2002. On a collection of Scarabaeid beetles from Pench Tiger Reserve (Seoni, Madhya Pradesh). Journal of Tropical Forestry, 18: 104-107.

Chandra K. & Ahirwar S.C., 2005a. Scarabaeid Beetles of Bandhavgarh National Park, Madhya Pradesh. Zoos' Print Journal, 20: 1961-1964.

Chandra K. & Ahirwar S.C., 2005b. Scarabaeid Beetles (Coleoptera) of Kanha Tiger Reserve, Madhya Pradesh. Records Zoological Survey of India, 105: 147-155.

Chandra K. & Ahirwar S.C., 2007. Insecta: Coleoptera: Scarabaeidae, p. 273-300. In Chandra K. (eds), Fauna of Madhya Pradesh (including Chhattisgarh).

State Fauna Series, 15, Zoological Survey of India, p. 1-564.

Chandra K. & Gupta D., 2011a. Study of Scarabaeid Beetles (Coleoptera) of Veerangana Durgavati Wildlife Sanctuary, Damoh, Madhya Pradesh, India, Deccan. Current Science, 5: 272-278.

Chandra K. & Gupta D., 2011b. Two New Records of genus *Onthophagus* Latreille, 1802 (Coleoptera: Scarabaeidae) from Madhya Pradesh, India. Uttar Pradesh Journal of Zoology, 31: 253-255.

Chandra K. & Gupta D., 2012. New Distributional Record of Five Species of *Onthophagus* (Coleoptera: Scarabaeidae: Scarabaeinae) from Central India. Scholarly Journal of Agricultural Science, 2: 8-12.

Chandra K. & Singh R. K., 2004. On a collection of Scarabaeid beetles (Coleoptera) from Pachmarhi biosphere reserve, Madhya Pradesh. Records Zoological Survey of India, 102: 43-46.

Chandra K., Khan, S. & Gupta D., 2012. New Records to the Species Diversity of Family Scarabaeidae and Hybosoridae (Coleoptera: Scarabaeoidea) of Jabalpur, Madhya Pradesh (India). Academic Journal of Entomology, 5: 28-36.

Chandra K., Khan, S., Gupta D. & Singh, S. P., 2011. Additional Records of Scarab Fauna (Coleoptera:

Scarabaeidae) of Pachmarhi Biosphere Reserve, Madhya Pradesh, India. National Journal of Life Sciences, 8: 65-68.

Davis A.L.D., Frolov A.V. & Scholtz C.H., 2008. The African Dung Beetle Genera. Protea Book House, Pretoria, 272 pp.

Fabricius J.C., 1792. Entomologia systematica emendata et aucta, secundum classes, ordines, genera, species adiectis, synonymis, locis, observationibus, descriptionibus. Tom. I. Hafniae: Christ. Gottl. Proft., xx+330 pp.

Newton P. N. & Malcolm J.C., 1985. Dung and Dung beetles in Kanha Tiger Reserve, Central Indian Highlands. Journal of Bombay Natural History Society, 85: 218-220.

Schaller J.G., 1783. Neue Insecten. Abhandlungen der Hallischen Naturforschenden Gesellschaft, 1: 217-328.

Schoolmeesters P., Davis A.L.D., Edmonds W.D., Gill B., Mann D., Moretto P., Price D., Reid C., Spector S. & Vaz-De-Mello F., 2008. ScarabNet Global Taxon Database, available at: <http://216.73.243.70/scarabnet/results.htm> (last access 30.05.2012).

Smith A. B. T. 2006. A review of the family-group names for the superfamily Scarabaeoidea (Coleoptera) with corrections to Nomenclature and a current Classification. Coleopterists Society Monograph, 5:144-204.